

Please amend the claims as shown in the following listing of claims:

Listing of Claims:

1. (Currently amended) A bistable, backlit cholesteric ~~chiral-nematic~~ liquid crystal display, comprising:

a) a layer of cholesteric ~~chiral-nematic~~ liquid crystal display material located between first and second substrates, said cholesteric liquid crystal material including focal conic and reflective planar textures that are stable in an absence of an electric field, said second substrate being closer to ~~a viewer of the display~~ an exterior of the display than said first substrate;

b) drive electronics ~~that~~ adapted to electrically address regions of the cholesteric liquid crystal material effective to cause said cholesteric liquid crystal material to exhibit the focal conic and planar textures ~~so as to form~~ resulting in an image ~~that is seen by a viewer of the display~~;

c) a bi-directional circular polarizer having opposing sides, wherein said bi-directional circular polarizer circularly polarizes light incident from either of said opposing sides including passing circularly polarized light to said layer of cholesteric ~~chiral-nematic~~ liquid crystal material;

d) a translector having a light reflective side and a light transmitting side, the light reflective side being adapted to reflect light received from said bi-directional circular polarizer, said bi-directional circular polarizer being located between said translector and said first substrate; and

e) a light source ~~that is~~ adapted to be selectively energizable to emit light, said light passing through said translector from said light transmitting side toward said light reflecting side.

2. (Original) The liquid crystal display of claim 1 wherein said planar texture has a circular polarization of a predetermined handedness.

3. (Cancelled).

4. (Previously presented) The liquid crystal display of claim 1 wherein said bi-directional circular polarizer comprises a first quarter wave retarder and a second quarter wave retarder and a linear polarizer located between said first quarter wave retarder and said second quarter wave retarder.

5. (Original) The liquid crystal display of claim 1 further comprising an alignment material on at least one of said first and second substrates.

6. (Currently amended) The liquid crystal display of claim 5 wherein said alignment material has provides a liquid crystal director of said cholesteric liquid crystal material with a pretilt angle of about 21° from the substrate.

7. (Currently amended) The liquid crystal display of claim 5 wherein said alignment material is adapted to orient molecules of said cholesteric liquid crystal material effective to enable light reflected from said display to have has an S3 stokes parameter greater than 0.75.

8. (Currently amended) The liquid crystal display of claim 5 wherein said alignment material is adapted to orient molecules of said cholesteric liquid crystal material effective to enable light reflected from said display to have has an S3 stokes parameter greater than 0.90.

9. (Original) The liquid crystal display of claim 1 further comprising a rubbed alignment material on both of said first and second substrates.

10. (Original) The liquid crystal display of claim 1 further comprising a rubbed alignment material on said first substrate.

11. (Original) The liquid crystal display of claim 1 wherein said light source has a spectral distribution that matches a reflection spectrum of the display.

12. (Currently amended) A bistable, backlit cholesteric ~~chiral-nematic~~ liquid crystal display, comprising:

a) a cholesteric ~~chiral-nematic~~ liquid crystal display material located between first and second substrates, said cholesteric liquid crystal material including a planar texture having a circular polarization of a predetermined handedness and a focal conic texture that are stable in an absence of an electric field, said second substrate being closer to ~~a viewer of the display~~ an exterior of the display than said first substrate;

b) drive electronics that adapted to electrically address regions of the cholesteric liquid crystal material effective to cause said cholesteric liquid crystal material to exhibit the focal conic and planar textures ~~so as to form~~ resulting in an image ~~that is seen by a viewer of the display~~;

c) a first quarter wave retarder;

d) a second quarter wave retarder;

e) a linear polarizer located between said first quarter waver retarder and said second quarter wave retarder;

f) a translector having a light reflective side and a light transmitting side, the light reflective side being adapted to reflect light received from said second quarter wave retarder, wherein said first quarter wave retarder, said linear polarizer and said

second quarter wave retarder are located between said transflector and said first substrate; and

g) a light source ~~that is~~ adapted to be selectively energizable to emit light, said light passing through said transflector from said light transmitting side toward said light reflecting side.

13. (Currently amended) The liquid crystal display of claim 12 wherein said light source is adapted to have has a spectral distribution that matches a reflection spectrum of the display.

14. (Original) The liquid crystal display of claim 12 further comprising an alignment material on at least one of said first and second substrates.

15. (Currently amended) The liquid crystal display of claim 14 wherein said alignment material ~~has~~ provides a liquid crystal director of said cholesteric liquid crystal material with a pretilt angle of about 21° from the substrate.

16. (Currently amended) The liquid crystal display of claim 14 wherein said alignment material is adapted to orient molecules of said cholesteric liquid crystal material effective to enable light reflected from said display ~~has to have~~ an S3 stokes parameter greater than 0.75.

17. (Currently amended) The liquid crystal display of claim 14 wherein said alignment material is adapted to orient molecules of said cholesteric liquid crystal material effective to enable light reflected from said display ~~has to have~~ an S3 stokes parameter greater than 0.90.

18. (Currently amended) The liquid crystal display of claim 12 further comprising a rubbed alignment material on at both of said first and second substrates.

Claims 19 - 25 (Cancelled).

26. (Currently amended) A bistable, backlit cholesteric ~~chiral-nematic~~ liquid crystal display, comprising:

a) a cholesteric ~~chiral-nematic~~ liquid crystal display material located between first and second substrates, said cholesteric liquid crystal material including focal conic and reflective planar textures that are stable in an absence of an electric field, an alignment material on at least one of said first and second substrates, said alignment material being adapted to orient molecules of said cholesteric liquid crystal material wherein said liquid crystal material reflects effective to enable light reflected from said display that has to have an S3 stokes parameter greater than 0.75, said second substrate being closer to a viewer of the display an exterior of the display than said first substrate;

b) drive electronics that adapted to electrically address regions of the cholesteric liquid crystal material effective to cause said cholesteric liquid crystal material to exhibit the focal conic and planar textures ~~so as to form~~ resulting in an image ~~that is seen by a viewer of the display;~~

c) a bi-directional circular polarizer having opposing sides, wherein said bi-directional circular polarizer is adapted to circularly ~~polarizes~~ polarize light incident from either of said opposing sides including passing circularly polarized light to said layer of cholesteric ~~chiral-nematic~~ liquid crystal material;

d) a translector having a light reflective side and a light transmitting side, the light reflective side being adapted to reflect light received from said bi-directional circular polarizer, said bi-directional circular polarizer being located between said translector and said first substrate; and

e) a light source ~~that is~~ adapted to be selectively energizable to emit light, said light passing through said translector from said light transmitting side toward said light reflecting side.

Claims 27 - 34 (Cancelled).

35. (Currently amended) A bistable, backlit cholesteric liquid crystal display device, comprising:

a layer of cholesteric ~~chiral-nematic~~ liquid crystal display material including focal conic and reflective planar textures that are stable in an absence of an electric field, said layer having a first side and a second side, the second side being closer to a ~~viewer of the display~~ an exterior of the display device than said first side;

means for selectively addressing regions of the cholesteric liquid crystal material effective to cause said cholesteric liquid crystal material to exhibit the focal conic and reflective planar textures resulting in an image ~~that can be seen by the viewer of the display device~~;

a bi-directional circular polarizer comprising a first quarter wave retarder, a second quarter wave retarder and a linear polarizer located between said first quarter wave retarder and said second quarter wave retarder;

a translector having a light reflective side and a light transmitting side, said bi-directional circular polarizer being located between said translector and said first side of said cholesteric ~~chiral-nematic~~ liquid crystal material, the light reflective side being adapted to reflect light received from said bi-directional circular polarizer; and

a light source ~~that is~~ adapted to be selectively energizeable to emit light, said light passing through said translector from said light transmitting side toward said light reflecting side.

36. (Currently amended) The liquid crystal display device of claim 35 further comprising an alignment layer in contact with at least one of said sides of said cholesteric liquid crystal layer, said alignment layer being ~~effective~~ adapted to orient adjacent molecules of said cholesteric liquid crystal material in a particular direction.

37. (Currently amended) The liquid crystal display device of claim ~~35~~ 36 wherein said molecules of said cholesteric liquid crystal material are oriented effective to enable light reflected from said display to have an S3 stokes parameter greater than 0.75.

38. (Currently amended) The liquid crystal display device of claim ~~35~~ 36 wherein said molecules of said cholesteric liquid crystal material are oriented effective to enable light reflected from said display to have an S3 stokes parameter greater than 0.90.

39. (Currently amended) The liquid crystal display device of claim 35 further comprising stacked layers of said cholesteric ~~chiral-nematic~~ liquid crystal material.

40. (Currently amended) The liquid crystal display device of claim 39 wherein one of said stacked layers of said cholesteric ~~chiral-nematic~~ liquid crystal material is ~~selected~~ adapted to have a pitch length effective to reflect visible light of one color and another of said stacked layers of said cholesteric ~~chiral-nematic~~ liquid crystal material is ~~selected~~ adapted to have a pitch length effective to reflect visible light of a different color.

41. (Currently amended) The liquid crystal display device of claim 39 comprising a triple stack of said liquid crystal layers, wherein one of said layers is adapted to reflect

~~reflects~~ red light, one of said layers is adapted to reflect ~~reflects~~ green light and one of said layers is adapted to reflect ~~reflects~~ blue light.

42. (Currently amended) The liquid crystal display device of claim 39 wherein one of said stacked layers ~~of said chiral nematic liquid crystal material is selected~~ adapted to have a pitch length effective to reflect visible light of one color and another of said stacked layers ~~of said chiral nematic liquid crystal material is selected~~ adapted to have a pitch length effective to reflect infrared electromagnetic radiation.

43. (Currently amended) The liquid crystal display device of claim 35 wherein said means for selectively addressing regions of the cholesteric liquid crystal material comprises drive electronics that electrically address regions of the cholesteric liquid crystal material effective to cause said cholesteric liquid crystal material to exhibit the focal conic and planar textures ~~so as to form~~ resulting in an image ~~that is seen by the viewer of the display device.~~

44. (Currently amended) A bistable, backlit cholesteric liquid crystal display comprising:

a layer of cholesteric ~~chiral nematic~~ liquid crystal display material including focal conic and reflective planar textures that are stable in an absence of an electric field, said layer having a first side and a second side, the second side being closer to a ~~viewer of the display~~ an exterior of the display than the first side;

drive electronics ~~that~~ adapted to electrically address regions of the cholesteric liquid crystal material effective to cause said cholesteric liquid crystal material to exhibit the focal conic and planar textures ~~so as to form~~ resulting in an image ~~that is seen by the viewer of the display;~~

a ~~bi-directional circular polarizer~~ polarizing means for having opposing sides, wherein said ~~bi-directional circular polarizer~~ circularly polarizing polarizes light in two

~~opposite directions and for incident from either of said opposing sides including passing~~
circularly polarized light to said layer of cholesteric ~~chiral-nematic~~ liquid crystal material;

a transflector having a light reflective side and a light transmitting side, said bi-directional circular polarizer being located between said transflector and said first side of said layer of cholesteric ~~chiral-nematic~~ liquid crystal material, the light reflective side being adapted to reflect light received from said polarizing means ~~bi-directional circular polarizer~~; and

a light source ~~that is~~ adapted to be selectively energizable to emit light, said light passing through said transflector from said light transmitting side toward said light reflecting side.

45. (Currently amended) A bistable, backlit cholesteric liquid crystal display comprising:

a layer of cholesteric ~~chiral-nematic~~ liquid crystal display material including focal conic and reflective planar textures that are stable in an absence of an electric field, said layer having a first side and a second side, the second side being closer to a ~~viewer of the display~~ an exterior of the display than the first side, an alignment material on at least one of said first and second substrates, said alignment material being adapted to orient molecules of said cholesteric liquid crystal material wherein said liquid crystal material reflects effective to enable light reflected from said display ~~that has to have~~ an S3 stokes parameter greater than 0.75;

drive electronics ~~that adapted to~~ electrically address regions of the cholesteric liquid crystal material effective to cause said cholesteric liquid crystal material to exhibit the focal conic and planar textures ~~so as to form~~ resulting in an image ~~that is seen by the viewer of the display~~;

a bi-directional circular polarizer ~~having opposing sides, wherein said bi-directional circular polarizer circularly polarizes light incident from either of said~~

~~opposing sides including passing circularly polarized light to said layer of chiral nematic liquid crystal material;~~

a transflector having a light reflective side and a light transmitting side, said bi-directional circular polarizer being located between said transflector and said first side of said layer of cholesteric ~~chiral nematic~~ liquid crystal material, the light reflective side being adapted to reflect light received from said bi-directional circular polarizer; and

a light source ~~that is~~ selectively energizable to emit light, said light passing through said transflector from said light transmitting side toward said light reflecting side.

46. (Currently amended) A bistable, backlit cholesteric liquid crystal display comprising:

a layer of cholesteric ~~chiral nematic~~ liquid crystal display material including focal conic and reflective planar textures that are stable in an absence of an electric field, said layer having a first side and a second side, the second side being closer to a ~~viewer of the display~~ an exterior of the display than the first side, a substrate having one side in contact with said second side of said layer of cholesteric ~~chiral nematic~~ liquid crystal display material and another side forming an external surface of said display;

drive electronics ~~that~~ adapted to electrically address regions of the cholesteric liquid crystal material effective to cause said cholesteric liquid crystal material to exhibit the focal conic and planar textures ~~so as to form~~ resulting in an image ~~that is seen by the viewer of the display;~~

a bi-directional circular polarizer ~~having opposing sides, wherein said bi-directional circular polarizer circularly polarizes light incident from either of said opposing sides including passing circularly polarized light to said layer of chiral nematic liquid crystal material;~~

a transflector having a light reflective side and a light transmitting side, said bi-directional circular polarizer being located between said transflector and said cholesteric ~~chiral-nematic~~ liquid crystal material, the light reflective side being adapted to reflect light received from said bi-directional circular polarizer; and

a light source ~~that is~~ adapted to be selectively energizable to emit light, said light passing through said transflector from said light transmitting side toward said light reflecting side.

47. (New) A bistable, backlit cholesteric liquid crystal display comprising:

a layer of cholesteric liquid crystal material including focal conic and reflective planar textures that are stable in an absence of an electric field, said layer having a first side and a second side, the second side being closer to an exterior of the display than the first side;

electrical addressing means for electrically addressing regions of the cholesteric liquid crystal material effective to cause said cholesteric liquid crystal material to exhibit the focal conic and planar textures resulting in an image;

polarizing means for circularly polarizing light in two opposite directions including passing circularly polarized light to said layer of cholesteric liquid crystal material;

transflector means for reflecting light incident on one side of the transflector and transmitting light incident on the other side of the transflector, said polarizing means being located between said transflector and said first side of said layer of cholesteric liquid crystal material; and

means for emitting light from said light transmitting side of said transflector toward said light reflecting side of said transflector.

48. (New) A bistable, backlit cholesteric liquid crystal display comprising:

a layer of cholesteric liquid crystal material including focal conic and reflective planar textures that are stable in an absence of an electric field, said layer having a first

side and a second side, the second side being closer to an exterior of the display than the first side;

drive electronics adapted to electrically address regions of the cholesteric liquid crystal material effective to cause said cholesteric liquid crystal material to exhibit the focal conic and planar textures resulting in an image;

a bi-directional circular polarizer;

a transflector having a light reflective side proximal to said bi-directional circular polarizer and a light transmitting side distal from said bi-directional circular polarizer, said bi-directional circular polarizer being located between said transflector and said first side of said layer of chiral nematic liquid crystal material; and

a light source located behind said transflector proximal to said light transmitting side and distal to said light reflecting side.